

Exercise 11

Integrated Population Models

Exercise A: Run code in file Exercise 11a.R. While each model is running, examine the JAGS code. Make sure each model has converged before proceeding to the next one. If you're having convergence problems, run it again, possibly with more iterations and/or more burn-in samples (iterations must be greater than burn-in).

1. Explain the differences between the three models.
2. Of the first two models, which do you think more closely matches the way the data were simulated ("True")? Why?
3. Would you count the third model as an IPM? Why or why not? How do its abundance estimates differ from the other two models? Why is that?

Exercise B: Run code with environmental stochasticity in survival (sim.ipm.data2a.R and Exercise 11b.R). The IPM will take a while to run. While it's going, give some thought to Exercise C.

4. Did the model converge? How do the estimates compare with the true values? Which parameter estimate seems most off?
5. Why might adding environmental stochasticity cause issues? Do you think survival affected by an external covariate would work better or worse than random variation?

Exercise C: If you have time, try removing or adding a source of data, or one of the other variants discussed in the lecture (DD, another form of ES, projection, etc.). Some potential additional sources of data:

- a. Known-fate
- b. Dead recoveries
- c. Counts that are stage-specific, not totals